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Philosophical Transactions

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wronging any contrary motion. And by the Arctic Pole, you may advance and retard this movement, if you should find any inequality, without altering at all the great Spring.

So far the Description of this artificial Globe ; of which we hope we shall very shortly know the price.

A Description of the Diamond-mines, as it was presented by the Right Honourable, the Earl Marshal of England, to the R. Society.

THe parts of the World known to contain *Diamonds*, are the Island *Borneo*, and the Continent of *India extra & intra Gangem*: *Pegu* is likewise reported to have several; but the King not potent, his Country being but thinly inhabited, contents himself with his Mines of *Rubies, Saphires, Topasses, Emeralds, Gold, Silver, Brass, Tinn and Lead*, and several other Commodities his Country affords, in great plenty, rather than to suffer new enquiries to be made, lest the discovery of such an additional Treasure should invite some of his Neighbours, more potent, to invade him. But leaving the description of other places to those that know them better, I shall only keep my self to the Coast of *Coromandel*, with which I am acquainted, and having visited several of its Mines, am able to say something thereof Experimentally.

The Diamond-Mines in these parts are generally adjacent to Rocky-hills, or Mountains, whereof begins a great Ledge or Range near *Cape Comorin*, extending in breadth about 50 *Engliss* miles, some conjoyning, others scatter'd: and running thence in length quite through *Bengala*. In, among, and near these Hills, in several places, are known to be (as its believed most of them have) Mines; many of them are possessed by petty Princes, or *Rajaes*, of the *Hundues*; some driven thither for shelter by the *Mores*, who have taken the greatest part of their Country from them; others never overcome, as the *Rajaes*, on the Hills in and near *Bengala*, who admit of little or no Commerce with their Neighbours or passage through their Country, which (being barren, in few places affording good water, the ways craggy and very toylsom, especially to an Army) the *Moors* covet not, but let them enjoy it peacably; yet to prevent danger, they forbid digging (as the King of *Pegu* does) or dig some few Mines only very privately, so that a great part of the Mines are unsearched and concealed. But the Kingdoms of *Golconda* and *Vijaiapore*

contain

contain in them scope enough of ground, known to have Mines sufficient to furnish all the World plentifully with Diamonds; but their Kings permit digging only in some places appointed, lest, as it is imagined, they should become too common; and withal for fear of tempting the threatening greatness of *Aurengzebe*; forbidding also those places that afford the largest Stones, or else keeping workmen in them for their own private uses: So that but a very small quantity (in comparison of what might be) and those only of ordinary size, are found.

In the Kingdom of *Golconda* (as near as I can gather from the best acquainted) are 23 Mines now employed, or that have been so lately, viz. *Quolure*, *Codawillicul*, *Malabar*, *Buttephalem*, *Ramiah*, *Gurem*, *Muttampellee*, *Currure*, *Ganjeconeta*, *Luttawaar*, *Jonagerree*, *Pirai*, *Dugullee*, *Purwillee*, *Anuntapellee*, *Girregeta*, *Maarmood*, *Wazzergerree*, *Mannemurg*, *Langumboot*, *Whootoor*, *Muddemurg*, and *Melwillee* or the New Mine.

Quolure was the first Mine made use of in this Kingdom. The Earth is something yellowish, not unlike the colour of our Gravel dried; but whiter in some places where it abounds with smooth pebbles, much like some of those that come out of our Grave-pits in *England*. They use to find great quantities in the Vein, if it may properly be so called, the Diamonds not lying in continued Clusters as some imagine, but frequently so very scattering, that sometimes in the space of $\frac{1}{4}$ of an Acre of ground, digged between two or three fathoms deep, there hath been nothing found; especially in the Mines that afford great Stones, lying near the superficies of the Earth, and about three fathoms deep; deeper they could not dig for water; it being in a Vale near a River. In other places the Earth is mixt with rugged Stones, where they seldom mine deeper, though in higher ground; before the colour of the Earth alters, and the Vein ceases; which they give a guess at by the small Stones they find in the Earth, the principal guide they have in the discovery of the Mines.

The Diamonds found in these Mines are generally well-shaped, many of them pointed, and of a good lively white water; but it also produces some *yellow* ones, some *brown*, and of other colours. They are of ordinary sizes, from about six in a *Mangelin* * (of which they find but few) to five or six *Mangelins*, each; some of 10, 15, 20 they find but rarely. They have frequentl

* A *Mangelin* is four grains in weight, saith *Linschoten*.

frequently a bright and transparent skin, inclining to a greenish colour, though the heart of the Stone be purely white; but the veins of these Mines are almost worn out.

The Mines of *Codawillikul*, *Malabar*, and *Buttepallem* consist of a reddish Earth, inclining to an orange-colour (with which it stains the clothes of the Labourers that work in it) they dig about 4 fathom deep. They afford Stones generally of an excellent water and crystalline skin; smaller sizes than those of *Quolure*, *Ramiah*, *Gurem*, and *Muttampellee*; have a yellowish Earth, like *Quolure*; their Stones like those of the two former Mines, but mixt with many of a blew water. These five Mines being under the same Government with *Melwillee*, where the Governour resides; He (to draw the Adventurers and Merchants near him, that he may be better informed of the actions and advantages, and know the better how to fleece them, the general practice of Governours in these parts;) has very lately forbid their use; and commanded all to repair to his Residence, which they must obey, or flee into another Government.

The next Mine in our way is *Currure*, the most famous of them all and most ancient. It has been under subjection of the King of *Golconda*; but about 25 years, taken, with the Country of *Karnaticum*, from the *Hendue-Rajaes*, about that time, by the *Nabob*, *Meer, Jumla*. In it have been found Diamonds of a *seize* weight, which is about 9 ounces *Troy* or $81\frac{1}{2}$ *Pago's* weight. It is only employed by the King for his own private use: The Diamonds that are found in it, are very well spread, large stones (it yields few or none small,) they have generally a bright skin, which inclines to a pale greenish colour, but within are purely white. The Soyl is reddish as many of the others.

About sixty or seventy years ago, when it was under the Government of the *Hundues*, and several persons permitted to adventure in digging, a *Portugeez* Gentleman went thither from *Goa*, and having spent in Mining a great sum of money to the amounts of 100000 *Pago's*, as 'tis reported, and converted every thing he brought with him, that would fetch any money, even to what wearing clothes he could spare, while the Miners were at work for the last day's expence, he had prepared a cup of Poyson, resolving, if that night he found nothing, to drink his last with the conclusion of his money; but in the Evening the Workmen brought him a very fair spread Stone of 20 *Pago's* weight,

in commemoration whereof he caused a great Stone to be erected in the place, with an Inscription engraven on it, in the *Hundues* or *Tellinga Tongue*, to the following effect, which remains to be seen to this day ;

*Your Wife and Children sell, sell what you have,
Spare not your Clothes, nay, make your self a Slave ;
But money get , then to CURRURE make hast ;
There search the Mines, a prize you'l find at last.*

After which he immediately returned with his Stone to *Goa*.

Not far from *Currure* are the Mines of *Lattawaar* and *Ganjeconta*, which are in the same Soyl as *Currure*, and afford Stones not unlike : But *Lattawaar* hath many representing the great end of a Razor-blade, thin on one side and thick on the other, very white and of an excellent water ; but the best of the Mine is worn out, and *Ganjeconta* employed only to the Kings private use.

Jonagerre, *Pirai*, *Dugulle*, *Purwillee* and *Anuntapellee*, consist also of Red earth, are now employed, and afford many large Stones ; part of them of a greenish water ; but the most absolute Mines are of *Wazzergerre* and *Munnemurg*, (the other rather representing Pits than Mines ;) for there they sink through high Rocks till they go so far below their basis , that they can go no further for water, in some places 40 or 50 fathom deep. The superficies of the Rocks consist of hard, firm, white stone, into which they cut a Pit like a Well, of about 4 or 5, in some places 6 foot deep, before they come to a crust of a Mineral Stone, like the Mineral of Iron ; when they fill the Hole with Wood and keep as hot a fire as they can there for 2 or 3 days, till they think it sufficiently heated ; then they pour-in water till they have quencht it, which also flakes and mollifies both Stone and Mineral ; both being cold , they dig again, take out all the crumbled stuff and dig up what they can besides, before they heat it anew ; the crust seldom is thicker than 3 or 4 foot, which ceasing, they come to a vein of Earth, that usually runs under the Rock 2 or 3 furlongs ; sometimes much further : This they dig all out and search , and if their first attempt prove successful, they go to work again (digging after the same manner) as deep as they can, till they come to water ; for the drawing whereof, wanting the help of Engins , known in *Europe* , they can go no deeper, although the Vein lie lower ; all lumps of the Mineral they break

break in pieces, and frequently find Diamonds enclosed in them. To work on these Mines is very expensive, but the advantage is commonly answerable; yet in respect of the certain disburse, that must be before any thing be found, they are not so much frequented as others, where they may try their fortunes with a smaller stock. The Earth they dig out is red: Many large Stones are found here; the smallest about 6 in a *mangelleen*. They are mixt waters, but the greatest part good, only of ill-favoured shapes, many cragged pieces of stones, some as if they had been parts of very great ones, others with pieces broken off them; yet I never heard of any that found two seeming fellows, although they do those that look as if they had been newly broken.

In *Langumboot* they dig as they do at *Wazzergerree* and *Mun-nemurg*; the Rock is not altogether so solid, but the Earth and Stones it produces much alike.

Wootoor should have been placed next to *Currure*, it lying near it, and affording Stones of a like magnitude, shapes and waters; 'tis employed only to the Kings use: And singular, in that its Diamonds are found in black Earth.

Muddemurg far exceeds all the rest for Diamonds of a delicate shape, water, and bright transparent skin, proud, as it were, in discovering their inward beauties, with which no other Mine can compare; yet it has also store of Veiny ones, but those likewise of so curious shape and water, that it is difficult to discover them from the good, especially the small ones. It produces Stones of divers magnitudes, from 10 and 12 in a *mangelleen*, to 6 or 7 *magelleens* each, and besides, some great ones. The Earth is red, but it's seated in the Woods, and the water so bad, that to all (except the people bred there) it presently occasions Feavers & destroys abundance, in so much that most of the Adventurers have forsaken it; notwithstanding which it hath been more profitable than any of the rest, the Vein frequently lying near the superficies of the Earth, seldom running deep, and is better furnished than any other yet discover'd. The River *Kishna*, of excellent waters, is but 9 miles distant; but the Miners or Merchants are either poor that they cannot, or else over awed by the Governour, pretend to be and dare not be at the charges of fetching their water from thence. Divers are of the opinion, that, besides the Water, the Town lying in a bottom, environ'd with Hills and Morasses adjoining, the Air may be infected, and contribute to its unhealthfulness.

Melwillee or the *New Mine*, so called, because it was but lately found out (or at least permitted to be made use of) in the year 1670; it had then a year employed the Miners, but it was forbidden and lay unoccupied till 1673, when complaint being made at *Quolour*, that the Vein was worn out, the King again licensed its setlement. The Earth they mine in, is very red, and many of the Stones found there have of it sticking to them, as if it had clung there while they were of a soft glutinous substance and had not attained their hardness, maintaining its colour on its skin (seeming to be roughened with it) that it cannot be fetcht out by grinding on a rough Stone with Sand, which they make use of to clean them. The Stones are generally well-shaped, their size from 5 or 6 in a *mangelleen* to those of 14 or 15 each, and some bigger; but greatest quantities of the middle sorts: Most of them have a thick dull skin, incline to a yellowish water, not altogether so strong & lively as of the other Mines; very few of them of a crystallin water & skin. They are reported to be apt to flaw in splitting, which occasions these people to esteem them something softer than the product of many of the other Mines: several that flatter by their seeming whiteness when rough, discover their deceitfulness having past the Mill, and too often a yellowish tincture, to the disappointment and loss of them that have cut them; but what they want in goodness, is in part supplied by the plenty they find, which, together with their properties, make them the cheaper. This being what I have gathered, both by experience of several of the places I have seen, and the best Informations I could meet with, of the Mines in this Kingdom; I shall now proceed to those in *Vissapore*.

Vissapore is known to contain Mines enclosing Stones as large and good as those of *Golconda*; but the King, for reasons already given, makes use but of the meanest: whereby, as *Golconda* is famous for the largeness of those it affords, *Vissapore* is noted for the smallest; whose Mines, though they seldom or never render an Adventurer a fortune or estate at once, as sometimes those of *Golconda* do, by a great Stone or several found together; yet they are more populous and better employed, the small Stones lying thicker in the earth, so that the generality are gainers, and few but they get their expence; whereas those of *Golconda* dig away a considerable Estate and find nothing, others not their charges, and where one is a gainer, divers lose,

There

There are 15 Mines employed in the Kingdom of *Vijapore*, viz *Ramulconeta*, *Banugunnappellee*, *Pendekull*, *Moodavarum*, *Cummerwillee*, *Paulkull*, *Workull*, *Lungeepoleur*, *Pootloor*, *Punchelingull*, *Shingarrampent*, *Tondarpaar*, *Gundepellee*, *Donee* and *Gazerpellee*.

In *Ramulconeta* Mines in red Earth, about 15 or 16 foot deep, they seldom find a Diamond of a *mangelleen* weight, but small to 20 or 30 in a *mangelleen*. They are generally of an excellent crystalline water, have a bright clear skin, inclining frequently to a pale greenish colour, are well shaped, but few of them pointed ones. There are also found amongst them several broken pieces of Diamonds, by the Country people called *Shemboes*.

In *Banugunnappellee*, *Pendekull*, and *Moodavarum*, they dig as at *Ramulconeta*, and in the same kind of Earth; they also afford Stones much alike, being neighbouring places.

Cummerwillee, *Paulkull*, and *Workull*, are not far distant, produce Stones much alike out of the same coloured Earth, but very small ones even to a 100 in a *mangelleen*.

Lungeepoleur Mines are of a yellowish Earth (like those of *Quoleur*), its Diamonds are generally well shaped, globular, few pointed, of a very good crystalline water and bright skins; many of them have a thick dark grass-green skin, some spotted also with black, that they seem all foul, yet are not so, but within purely white and clean. Their sizes are from 2 or 3 *mangelleens* downwards, but few very small.

Pootloor Mines are of reddish Earth, but afford Stones much like those of *Lungeepoleur*, only smaller, under a *mangelleen*; the general sizes are of $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{8}$ of a *mangelleen*.

Punchelingull, *Shingarrampent*, and *Tondarpaar*, are also of red Earth, their Diamonds not unlike those of *Quoleur*, only rarely or never any large ones are found there.

Gundepellee hath the same Earth with the former, and produces Stones of equal magnitude; but frequently of a pure crystalline water, wherein they exceed the former.

Donee and *Gazerpellee* dig both in red Earth likewise, and afford Stones alike, the greatest part whereof are of good shapes and waters. They have also many *Shemboes*, and some of bad waters, some brown, which these people call soft or weak water'd, being esteemed of a softer and weaker body than others, by reason they have not so much life, when cut, and are subject to flaw in splitting, and on the Mill; their general product is in

Stones of middle sizes : But *Gazerpellee* has besides many large ones, and is the only Mine noted for such in the Kingdom of *Vijapore*. With which concluding the description of the Mines, I shall give some account, how the Diamonds are found, and how they handle the the Earth to find them ; which is as followeth :

The *Diamonds* are so scattered and dispersed in the Earth, and lie so thin, that in the most plentiful Mines its rare to find one in digging, or till they have prepared the stuff, and do search purposely for them : They are also frequently enclos'd in Clods ; and some of those of *Melwillee*, the New Mine in the Kingdom of *Golconda*, have the Earth so fixt about them, that till they grind them on a rough Stone with sand, they cannot move it sufficiently, to discover they are transparent ; or, were it not for their shapes, to know them from other Stones. At the first opening of the Mine, the unskilful Labourers, sometimes to try what they have found, lay them on a great Stone, and striking on them with another, to their costly experience discover they had broken a Diamond. One I knew who had an excellent Stone of 8 *magellens*, served so by ignorant Miners he employed.

Near the place where they dig, they raise a Wall with such rugged Stones as they find at hand (whereof all the Mines afford plenty) of about 2 foot high, and six foot over, flooring it well with the same ; for the laying of which they have no other Mortar than the Earth tempered with Water. To strengthen and make it tight they throw up a bank against the side of it: In one whereof they leave a small vent about two inches from the bottom, by which it empties it self into a little pit, made in the earth to receive small Stones, if by chance any should run through. The vent being stopped, they fill the Cistern they have made with water, soaking therein as much of the Earth they dig out of the Mines, as it can conveniently receive at a time, breaking the clods, picking out the great stones and stirring it with shovels, till the water is all muddy, the gravelly stuff falling to the bottom ; then they open the vent, letting out the foul water and supplying it with clean, till all the Earthy substance be wasted away, and none but a gravelly remains at the bottom. Thus they continue washing till about 10 of the Clock before Noon, when they take the gravelly stuff they have washed, and spread it on a place made plain and smooth (like a Bowling-alley) for the purpose, near the Cistern, which being soon dried by the heat

heat of the Sun at that time of the day, they very curiously look it over, that the smallest bit of a stone can hardly escape them. They never examine the stuff they have wash'd but between the hours of ten and three, least any cloud by interposing intercept the brisk beams of the Sun, which they hold very necessary to assist them in their search; the Diamonds, not forbearing to reflect them when they touch therein, rendring themselves thereby the more conspicuous.

Some of the expertest Labourers are employed in searching; he that sets them at work usually sitting by, and overlooking; but it's hardly possible, especially where many are employed, to watch them so narrowly, but that they may steal part of what they find, as many times some of them do, and, selling it privately, convert to their own use. If they find a large Stone, they carry it not presently to their Employer, but keep on looking, having an eye on him till they observe he takes notice of it, when with a turn of their hand they give him a glimpse of it, but deliver it not till they have done work, and then very privately, it being the general endeavour to conceal what they find, least it should come to the knowledge of the Governour of the place, and he require a share, which in the Kingdom of *Golconda* is usually practised, without respect to any agreement made with them.

The Miners, those that employ them, and the Merchants that buy the Stones of them, are generally *Ethnicks*; not a *Muslem*, that ever I heard of, followed the employment. These Labourers and their Employers are *Tellinga's*, commonly Natives of or near the place. The Merchants are the *Banians* of *Guzzarat*, who for some Generations have forsaken their own Country to take up the Trade, in which they have had such success, that 'tis now solely engross'd by them; who corresponding with their Country-men in *Surrat*, *Goa*, *Golconda*, *Visapore*, *Agra* and *Dilllee*, and other places in *India*, furnish them all with Diamonds.

The Governours of the Mines are also Idolaters: In the King of *Golcondas* Dominions a *Tellinga Brammee* rents most of them, whose agreement with the Adventurer is, that all the Stones they find under a * *Pagoda* weight, are to be their own;

all of that weight and above it to be his, for the Kings use: But although this Agreement be signed and sealed unto, he minds not at all the performance thereof, but endeavours

* A Pagoda weight is 9 Mangellicens.

endeavours to engross all the profit to himself by tyrannical squeezing both Merchants & Miners, whom he not only taxes very high, but maintaining Spies among them of their own people, on the least inkling that they have been any ways fortunate he immediately makes a demand on them, and raises their Tax; else, on a false pretence they have found a great Stone, drubs them till they surrender what they have, to redeem their bodies from torment. Besides, the Excise is so high on all sorts of Provisions, *Beetle*, and *Tobacco*, which to them is as absolutely necessary as Meat, or at least in their esteem, that it is thereby raised to double that price they bear without the Government; and it is furnished only by some Licens'd persons; if any other should endeavour to bring in the least quantity by stealth, he is fined (even for one leaf of *Tobacco*) if it be a person of any repute or worth any thing, else severely drub'd for it; by which course there is hardly a man worth 500 *l.* to be found amongst them, most of them dealing by Moneys taken up at Interest of Usurers, who reside there purposely to furnish them, who, with the Governour eat up their gains: so that one would wonder any of them should stay, and not betake themselves to places where they might have better usage; as there are several in other Governments, and some few that have the sense to remove; but many their Debts, others hopes of a great hit detains. Both Merchant and Miner go generally naked, only a poor Clout about their middle, and a Shash on their heads; they dare not wear a Coat, lest the Governour should say they have thriven much, are rich, and so enlarge his Demands on them. The wisest, when they find a great Stone, conceal it till they have an opportunity, and then with Wife and Children run all away into the *Vijapore* Country, where they are secure.

The Government in the *Vijapore* Country is better, their Agreement observ'd, Taxes easer, and no such Impositions on provisions; the Merchants go handsomely clad, amongst whom are several persons of considerable Estates, which they are permitted to enjoy peaceably, by reason whereof their Mines are much more populous and better employed than those of *Golconda*.

It is observable, that notwithstanding the Agreement with the Adventurers of the Mines, that all Stones above a certain weight shall be for the Kings use; yet in the Metropolis of either Kingdom, as the Cities of *Golconda* and *Vijapore* are, there is no seizure,

zure, all Stones are free; and the late deceased King, *Abdull Cutopshaw* of the former, and *Edelshaw* of the latter, would not only give very great prizes for large Stones, but richly vest and present the Merchant that sold them with Horses or something else of value, thereby encouraging others to bring the like. But the present King of *Vissapore* is a Child, and the King of *Golconda's* delights solely p'ated on light Women-dancers, and Trick-shewers, that he neither minds *Diamonds*, nor many things more necessary, committing the Government of his Kingdom to a *Tel-linga Braminee*, which the *Musleman* not well resenting, does in some measure threaten the stability of his State.

An Account of some Books :

- I. *The Primitive Origination of Mankind, considered and examined according to the Light of Nature; By the Honourable Sir Matthew Hale, Kt. late Lord Chief Justice of his Majesties Court of Kings Bench. London, 1677. in fol.*

THe Worthy and Learned Author of this Book (whose Death is exceedingly regretted by all good and intelligent men, upon the account of his singular integrity and great knowledge) hath therein principally considered these particulars :

- I. That according to the Light of Nature and right Reason the World was not Eternal, but had a beginning. Where, having occasionally treated of the Excellency of Human Nature, he briefly considers the several *Hypotheses* concerning the Eternity of the World, refuting those Objections made by some against the Truths deliver'd by him.

- II. That, if there could be any imaginable doubt of the Worlds having a Beginning, yet by the necessary evidence of Natural Light it doth appear, that Mankind had a beginning, and that the Successive Generations of Men were in their Original *ex non-genitis*. Where he delivers Eight Evidences to evince the Beginning of Mankind, and those so many Proofs of Facts, whereof the *First* is taken from the Antiquity of History and the Chronological Account of Times : The *second*, from the apparent Evidences of the first Foundation of the greatest and ancientest Kingdoms and Empires : The *third*, from the Invention of Arts : The *fourth*, from the beginnings of the Religions and Deities of the Heathens ; where the Author conceals not the deficiency of this proof : The *fifth*, from the Decays of Human Nature :